

WHAT IS CLAIMED IS:

1. A process for the preparation of a pigment dispersion which comprises a pigment surface treatment step of introducing at least one hydrophilic dispersibility-providing group onto the surface of a pigment directly and/or with the interposition of a polyvalent group, and a dispersion step of dispersing a surface-treated pigment obtained at said surface treatment step in an aqueous medium, wherein said dispersion step involves the dispersion of said surface-treated pigment in admixture with a wetting agent and water and a resin for providing dispersibility and/or fixability is added during and/or after said dispersion step.

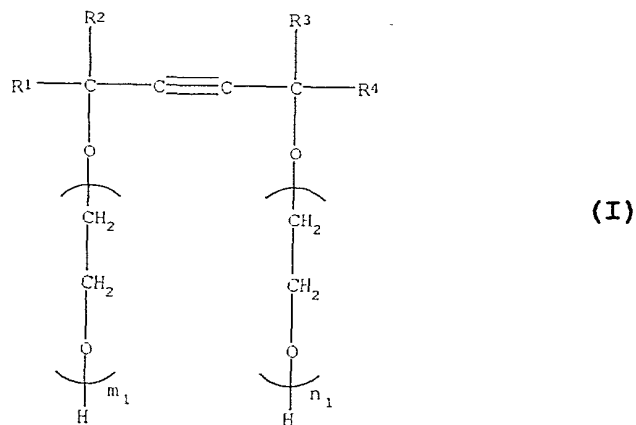
2. The process for the preparation of a pigment dispersion according to Claim 1, wherein the surface tension at 20°C of the mixture at said dispersion step is not higher than 40 mN/m.

3. The process for the preparation of a pigment dispersion according to Claim 1, wherein the pigment concentration in the mixture at said dispersion step is not higher than 50% by weight as calculated in terms of weight.

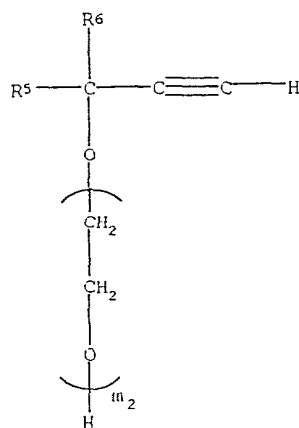
4. The process for the preparation of a pigment dispersion according to Claim 1, wherein the wetting agent to be used at said dispersion step comprises one or more materials selected from the group consisting of acetylene glycols, acetylene alcohols, glycol ethers and alkylene glycols.

5. The process for the preparation of a pigment dispersion according to Claim 4, wherein the wetting agent comprises acetylene glycols and/or acetylene alcohols in an amount of from not lower than 1/50 of to twice the amount of said pigment by weight.

6. The process for the preparation of a pigment dispersion according to Claim 4 or 5, wherein said acetylene glycols and acetylene alcohols are compounds represented by the following general formulae (I) and (II), respectively:



wherein R^1 , R^2 , R^3 and R^4 each independently represent an alkyl group; and the sum of m_1 and n_1 is from 0 to 30.



(II)

wherein R^5 and R^6 each independently represent an alkyl group; and m_2 is from 0 to 30.

7. The process for the preparation of a pigment dispersion according to Claim 1, wherein said hydrophilic dispersibility-providing group to be introduced onto the surface of a pigment at said surface treatment step comprises at least one selected from the group consisting of functional groups represented by the following general formulae and salts thereof:

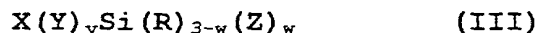
$-\text{OM}$, $-\text{COOM}$, $-\text{CO}-$, $-\text{SO}_3\text{M}$, $-\text{SO}_2\text{M}$, $-\text{SO}_2\text{NH}_2$, $-\text{RSO}_2\text{M}$, $-\text{PO}_3\text{HM}$, $-\text{PO}_3\text{M}_2$, $-\text{SO}_2\text{NHCOR}$, $-\text{NH}_3$, $-\text{NR}_3$ in which M represents a hydrogen atom, alkaline metal, ammonium or organic ammonium; and R represents a C_{1-12} alkyl group, a phenyl group which may have a substituent or a naphthyl group which may have a substituent.

8. The process for the preparation of a pigment dispersion according to Claim 1, wherein said hydrophilic

dispersibility-providing group to be introduced onto the surface of a pigment at said surface treatment step is a sulfur-containing dispersibility-providing group.

9. The process for the preparation of a pigment dispersion according to Claim 1, wherein the amount of said resin to be added is from not lower than 1/10 of to three times the amount of said pigment by weight.

10. The process for the preparation of a pigment dispersion according to Claim 1, wherein said resin comprises an alkali-soluble resin and/or a vinyl polymer obtained by the copolymerization of (a) one or more selected from the group consisting of silicon macromer represented by the following general formula (III) and acrylamide or methacrylamide-based monomer (excluding said monomer having salt-producing groups), (b) a polymerizable unsaturated monomer having a salt-producing group and (c) a monomer copolymerizable with these monomers in the presence of a radical polymerization initiator:



wherein X represents a polymerizable unsaturated group; Y represents a divalent connecting group; R represents a hydrogen atom, a lower alkyl group, an aryl group or an alkoxy group, with the proviso that a plurality of R's may be the same or different; Z represents a monovalent siloxane polymer moiety

having a number-average molecular weight of at least about 500; v represents 0 or 1; and w represents an integer of from 1 to 3.

11. The process for the preparation of a pigment dispersion according to Claim 1, wherein said resin exhibits a glass transition temperature of not lower than 50°C.

12. The process for the preparation of a pigment dispersion according to Claim 1, wherein said resin has a weight-average molecular weight of from 1,600 to 50,000.

13. The process for the preparation of a pigment dispersion according to Claim 1, wherein said resin exhibits an acid value of from 10 to 250.

14. The process for the preparation of a pigment dispersion according to Claim 10, wherein among said resins, the alkali-soluble resin is a styrene-acrylic acid copolymer.

15. The process for the preparation of a pigment dispersion according to Claim 1, wherein the liquid component of the pigment dispersion thus prepared comprises polyvalent metal ions in total amount of not higher than 600 ppm.

16. The process for the preparation of a pigment dispersion according to Claim 15, wherein the amount of Si, Ca, Mg, Fe, Cr and Ni ions to be incorporated in the liquid component of the pigment dispersion thus prepared are each not higher than 100 ppm.

17. The process for the preparation of a pigment

dispersion according to Claim 1, wherein said pigment for introducing a hydrophilic dispersibility-providing group at said surface treatment step comprises a carbon black pigment and/or an organic pigment.

18. The process for the preparation of a pigment dispersion according to Claim 1, wherein said pigment for introducing a hydrophilic dispersibility-providing group at said surface treatment step comprises one or more pigments selected from the group consisting of C.I. pigment red, C.I. pigment yellow, C.I. pigment violet, C.I. pigment blue, C.I. pigment orange, C.I. pigment green, and C.I. pigment brown.

19. The process for the preparation of a pigment dispersion according to Claim 1, wherein said pigment for introducing a hydrophilic dispersibility-providing group at said surface treatment step comprises one or more pigments selected from the group consisting of phthalocyanine pigment, quinacridone pigment, condensed azo pigment, isoindolinone pigment, quinophthalone pigment, anthraquinone pigment, benzimidazolone pigment, and perylene pigment.

20. The process for the preparation of a pigment dispersion according to Claim 1, wherein said surface treatment step involves the introduction of a polymer material onto the surface of a pigment directly and/or with the interposition of a polyvalent group.

21. A pigment dispersion prepared by the process for

the preparation of a pigment dispersion described in any one of Claims 1 to 20.

22. An ink jet recording ink at least comprising the pigment dispersion described in Claim 21.

23. An ink jet recording method which comprises energizing the ink described in Claim 22 so that it is ejected from a recording head and attached to a recording medium.

24. The ink jet recording method according to Claim 23, wherein said energy is a dynamic energy.

25. The ink jet recording method according to Claim 23, wherein said energy is a heat energy.

26. A recorded material obtained by the method described in any one of Claims 23 to 25.